

# Notice of Allowability

Application No.

09/320,349

Examiner

Daniel Swerdlow

Applicant(s)

WEDGE, DONALD SCOTT

Art Unit

2615

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 13 November 2006 and interview conducted 24 January 2007.
2. ☒ The allowed claim(s) is/are 1,7,14,18-24 and 28-35.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☒ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☒ to Paper No./Mail Date 19 June 2003.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                     |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance             |
|  | 9. <input type="checkbox"/> Other _____   |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Brent Capehart, reg. no. 39,620 on 1 February 2007.

The application has been amended as follows:

In the claims:

This listing of claims replaces all prior versions, and listings, of claims in the application.

Markup is made with respect to the amendment filed on 13 November 2006.

The claims are amended to read as follows:

Claim 1 (currently amended): A method for listening to simultaneous audio signals, the method comprising:

receiving a first audio signal from a first source;

adding only a first differentiation cue to the first audio signal to produce a first stereo signal having a right first audio signal and a left first audio signal;

receiving a second audio signal from a second source;

producing a second stereo signal having a right second audio signal and a left second audio signal from said second audio signal;

providing the right first audio signal and right second audio signal to a right audio transducer; and

providing the left first audio signal and the left second audio signal to a left audio transducer;

wherein said first differentiation cue consists of an amplitude difference of at least 3 dB between the right first audio signal and the left first audio signal and provides differentiation to allow a listener to simultaneously hear and understand said first and second audio signals without degradation to the intelligibility of said signals; and

wherein at least one of said sources does not have any capability to receive any of said stereo signals.

Claims 2-6 (cancelled).

Claim 7 (currently amended): A communication system comprising:

a first audio input configured to receive a first monaural audio signal from a first source;  
a second audio input configured to receive a second monaural audio signal from a second source;

a first differentiation block coupled to the first audio input and providing only a fixed first differentiation cue in the form of only an amplitude difference of at least 3 dB to the first audio input to create ~~a having~~ a first right channel and a first left channel;

a second differentiation block coupled to the second audio input and providing a second differentiation cue to the second audio input to create a second right channel and second left channel;

a left channel summer combining the first left channel and the second left channel to produce a left channel output; and

a right channel summer combining the first right channel and the second right channel to produce a right channel output;

wherein said first differentiation cue provides differentiation to allow a listener to simultaneously hear and understand said first and second audio signals without degradation to the intelligibility of said signals; and

wherein one of said sources does not have any capability to receive any of said left channel or right channel outputs.

Claims 8-13 (canceled).

Claim 14 (previously presented): A method for listening to simultaneous audio information, the method comprising:

providing a first monaural audio signal from a first source;

adding only a first differentiation cue in the form of only an amplitude difference of at least 3 dB to the first monaural audio signal to produce a first stereo signal having a left signal and a right signal;

providing a second audio signal from a second source, the second audio signal being at least partially simultaneous with the first monaural audio signal;

coupling the left signal, the right signal, and the second audio signal to a stereo transducer;

wherein said first differentiation cue provides differentiation to allow a listener to simultaneously hear and understand said first and second audio signals without degradation to the intelligibility of said signals;

wherein said cues are added independent of any positional information corresponding to said audio signals; and

wherein one of said sources does not have any capability to receive any of said stereo signals.

Claims 15-17 (cancelled).

Claim 18 (currently amended): An apparatus for listening to a plurality of contemporaneous radio transmissions, the apparatus comprising:

a plurality of front microphone inputs, including a first microphone input and a second microphone input for producing a front microphone signal;

a first differentiation block for adding a first differentiation cue consisting only of one or both of an amplitude difference of at least 3dB and a differential spectral filtering to said front microphone signal to provide a first stereo signal having a front right channel signal and a front left channel signal;

a right summer for receiving said front right channel signal;

a left summer for receiving said front left channel signal;

at least one of a plurality of navigation and/or annunciator inputs for providing an annunciator signal;

a third differentiation block for adding a third differentiation cue consisting only of one of an amplitude difference of at least 3dB and a differential spectral filtering to said annunciator signal to provide a differentiated signal to said right summer and said left summer;

a fourth differentiation block for adding a fourth differentiation cue consisting only of one of an amplitude difference of at least 3dB and a differential spectral filtering to a first communication input signal (Com 1) to provide a differentiated signal to said right summer and said left summer;

a fifth differentiation block for adding a fifth differentiation cue consisting only of one of an amplitude difference of at least 3dB and a differential spectral filtering to a second communication input signal (Com2) to provide a differentiated signal to said right summer and said left summer;

a left output channel for providing a summed output signal from said left summer; and

a right output channel for providing a summed output signal from said right summer,

wherein, said differentiation cues differ from one another to allow a listener to simultaneously hear and understand said signals without degradation to the intelligibility of said signals.

Claim 19 (original): The apparatus of claim 18 further comprising:

a summer for summing said first and said second microphone inputs to produce said front microphone signal.

Claim 20 (currently amended): The apparatus of claim 18 further comprising:

a plurality of back microphone inputs, including a third microphone input and a fourth microphone input, for producing a back microphone signal;

a differentiation block for adding a second differentiation cue consisting only of one of an amplitude difference of at least 3dB and a differential spectral filtering to said back microphone signal to provide a back right channel signal to said right summer and a back left channel signal to said left summer.

Claim 21 (original): The apparatus of claim 20 further comprising:

a summer for summing said third and said fourth microphone inputs to produce said back microphone signal.

Claim 22 (original): The apparatus of claim 18 further comprising:

an input for an automatically mutable stereo entertainment system for providing a first input to said left summer and a second input to said right summer.

Claim 23 (previously presented): An apparatus configured to modify radio signals between an avionics panel in an airplane and a stereo headset, comprising:

a first audio input configured to receive a first monaural audio signal from a first source;  
a second audio input configured to receive a second monaural audio signal from a second source;

a first differentiation block coupled to the first audio input and providing a first fixed differentiation cue in the form of only an amplitude difference of at least 3 dB to the first audio input to create a first right channel and a first left channel;

a second differentiation block coupled to the second audio input and providing a second fixed differentiation cue in the form of only an amplitude difference of at least 3 dB to the second audio input to create a second right channel and a second left channel;

a left channel summer combining the first left channel and the second left channel to produce a left channel output; and

a right channel summer combining the first right channel and the second right channel to produce a right channel output;

wherein said first differentiation cue provides differentiation to allow a listener to simultaneously hear and understand said first and second audio signals without degradation to the intelligibility of said signals; and

wherein one of said sources does not have any capability to receive any of said left channel or right channel outputs.

Claim 24 (currently amended): A method for listening to simultaneous audio signals, the method comprising:

receiving a first audio signal from a first source;

adding only a first differentiation cue in the form of only a differential ~~time delay~~ spectral filtering to the first audio signal to produce a first stereo signal having a right first audio signal and a left first audio signal;



receiving a second audio signal from a second source; producing a second stereo signal having a right second audio signal and a left second audio signal from said second audio signal;

providing the right first audio signal and right second audio signal to a right audio transducer; and

providing the left first audio signal and the left second audio signal to a left audio transducer;

wherein said first differentiation cue provides differentiation to allow a listener to simultaneously hear and understand said first and second audio signals without degradation to the intelligibility of said signals; and

wherein one of said sources does not have any capability to receive any of said stereo signals.

Claims 25-27 (cancelled).

Claim 28 (previously presented): The communication system of Claim 7, being further defined as having said second monaural audio signal being produced by a microphone coupled to the communication system.

Claim 29 (previously presented): The communication system of Claim 7, being further defined as having said first monaural audio signal being provided from a radio receiver.

Claim 30 (previously presented): The communication system of Claim 29, further comprising:

a microphone coupled to the communication system and, the microphone producing a third audio signal coupled to a third differentiation block, the third differentiation block providing a third differentiation cue to the third signal to produce a third left channel and a third right channel, the third left channel being coupled to the left channel summer and the third right channel being coupled to the right channel summer.

Claim 31 (previously presented): The communication system of Claim 29, further comprising:

a detector coupled to the radio receiver, the detector coupled to a switch disposed between the second audio input and the left channel summer and the right channel summer, the switch being responsive to a detection signal produced by the detector and opening when a signal is detected.

Claim 32 (previously presented): The communication system of Claim 7, further comprising:

a resistive voltage divider providing said first fixed differentiation cue.

Claim 33 (currently amended): The communication system of Claim [[7]] 32, wherein said first differentiation block being defined as being coupled to said first audio input and providing said fixed first differentiation cue to said first audio input to create said first right channel and said first left channel; and

wherein said second differentiation block being defined as being coupled to said second audio input and providing only said fixed second differentiation cue to said second audio input to create said second right channel and said second left channel; and

wherein said resistive voltage divider provides an amplitude difference of at least about 3 dB between the left channel output and the right channel output.

Claim 34 (previously presented): The method for listening to simultaneous audio signals of Claim 24, wherein said first differentiation cue being defined as being in the form of a differential frequency gain.

Claim 35 (previously presented): The method for listening to simultaneous audio signals of Claim 24, wherein said step of receiving said second audio signal being defined as receiving said second audio signal in the form of a second radio broadcast or intercom from a second source.

### REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance:
3. Regarding Claim 1, Begault et al. (NASA-TM-102279 hereinafter "Techniques") discloses a method of producing distinct spatial locations for incoming sounds (pp. 4-5; Fig. 3) comprising: receiving a first audio signal from a first source (Input #1); adding only a first differentiation cue ( $T_d$ ,  $g$ ) to the first audio signal to produce a first stereo audio signal having a right first audio signal (top input of right summing amplifier) and a left first audio signal (top input of left summing amplifier); receiving a second audio signal from a second source (Input #2); producing a second stereo audio signal having a right second audio signal (middle input of right summing amplifier) and a left second audio signal (middle input of left summing amplifier); providing the right first audio signal and the right second audio signal to a right audio

transducer (Right speaker); providing the left first audio signal and the left second audio signal to a left audio transducer (Left speaker). Techniques further discloses that the respective input signals “are heard in ... distinctly different spatial locations” (i.e., allow a user hear and understand the audio signals without degradation) (p. 4) and shows no signal flow from the stereo signals back to the inputs. However, Techniques discloses use of both gain and delay to create the distinctness. Similarly, US Patent 5,438,623 to Begault discloses use of a time delay and a head-related transfer function (Fig. 2) to create distinctness between a plurality of sound sources. As such, the prior art fails to disclose a differentiation cue for allowing intelligible simultaneous comprehension of distinct audio sources consisting only of an amplitude difference of at least 3dB between a right audio signal and a left audio signal derived from a first received audio signal, as claimed. Because the prior art fails to disclose every element of the claimed invention, Claim 1 is allowable.

4. Claims 7, 14 and 23 contain limitations similar to Claim 1 and are allowable for the same reasons.

5. Regarding Claim 18, as shown above, the prior art relies on delay and/or head-related transfer function to create distinctness between sound sources. As such, the prior art fails to disclose a differentiation cue for allowing intelligible simultaneous comprehension of distinct audio sources consisting only of a differential spectral filtering, as claimed. Because the prior art fails to disclose every element of the claimed invention, Claim 18 is allowable.

6. Claim 24 contains limitations similar to those of Claim 18 and is allowable for the same reasons.

7. Claims 19 through 22 and 28 through 35 are allowable due to dependence from their respective base claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 571-272-7531. The examiner can normally be reached on Monday through Friday between 7:30 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh H. Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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